



GUIDELINE FOR
THE CONTROL
OF
INDUSTRIAL PHOSPHORUS
DISCHARGES
IN
LIQUID EFFLUENTS

October, 1976



Ontario

Ministry
of the
Environment

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STATEMENT OF INTENT

The primary purpose of these guidelines is to assist Ministry staff in the execution of abatement and approvals functions. They may also be used by industry as an indication of environmental control requirements.

These guidelines are supplementary to the "Guidelines and Criteria for Water Quality Management in Ontario", the "Objectives for the Control of Industrial Wastes Discharges in Ontario", and the requirements of The Environmental Protection Act.

The guidelines reflect overall Ministry policy. They should be applied recognizing specific requirements of individual sites, alternate process and abatement technology, and the need to stage programs which will achieve the Ministry's goals in a rapid but realistic manner.

INTRODUCTION

Industrial phosphorus discharges may have impact on receiving waters by virtue of their nutrient value and hence their potential to cause excessive algal growths. This is of particular significance in the lower Great Lakes drainage basin which has been identified by The International Joint Commission as being threatened by nutrient inputs.

Programs for the control of phosphorus discharges from municipal sewerage systems have been implemented in Ontario in response to the Canada-United States Agreement on Great Lakes Water Quality. It, therefore, seems reasonable to apply controls to industrial discharges which are consistent with municipal abatement programs.

GENERAL PRINCIPLES OF PHOSPHORUS CONTROLS

Recognizing that all phosphorus discharges are potentially significant from the standpoint of nutrient input and eutrophication of receiving waters, the following general principals will form the basis for the control of industrial phosphorus discharges:

1. Where practicable, industrial phosphorus inputs to natural waters shall be controlled or eliminated;
2. In cases where control technology (either external controls or in-plant abatement) is not practicable, the discharge under consideration shall be assessed on the basis of its potential impact on the receiving stream. Where necessary, and in the absence of available technology, alternative disposal may be required;
3. Without limiting the above general principles, the effluent objective for industrial phosphorus discharges shall be 1 mg/l maximum total phosphorus;
4. Plants with discharges of less than 10 lb/day total phosphorus shall be exempted from these guidelines;

5. Phosphorus control requirements should not discourage the application of biological treatment (with phosphorus nutrient addition) to the abatement of gross pollution.

Where biological treatment is used to abate gross pollution problems, the control of phosphorus discharges from such systems shall be weighed against the benefits to be derived from the reduction of the gross pollution and the impact of the phosphorus discharge on the receiving stream.

Phosphorus controls should complement biological treatment where they are deemed necessary and will be beneficial to the environment.

6. Phosphorus controls should not discourage reduced water usage, abatement of acute toxicity or other effects which are of benefit to the environment.

PHOSPHORUS CONTROL TECHNOLOGY

The technology that has been applied to the control of municipal phosphorus discharges include chemical precipitation with lime, alum, ferrous and ferric salts and waste pickle liquor. In addition, the controls on levels of phosphorus in laundry detergents that have been implemented under The Canada Water Act have had significant impact on municipal discharges.

Chemical precipitation is applicable to some industrial phosphorus discharges but, in common with the municipal situation, the specific technology that is applied must be determined by experiment. Chemical precipitation can be used to best advantage in those situations where it can be integrated into an existing or proposed industrial waste treatment system. For example, those industries which have existing solids separation facilities can install chemical precipitation equipment for phosphorus removal which will utilize the existing clarifiers or settling basins.

As an alternative, non-phosphorus water conditioning chemicals may be used to eliminate phosphorus discharges provided that adequate water conditioning is achieved and there are no greater adverse effects on the environment.

The disposal of industrial effluents to municipal sewerage systems where phosphorus removal facilities have been incorporated into the municipal sewage treatment process also represents an available option for the control of industrial phosphorus discharges. However, this should only be considered where there is capacity in the sewerage system to accept the effluent and where no adverse effects on the treatment process are anticipated from the industrial effluents.